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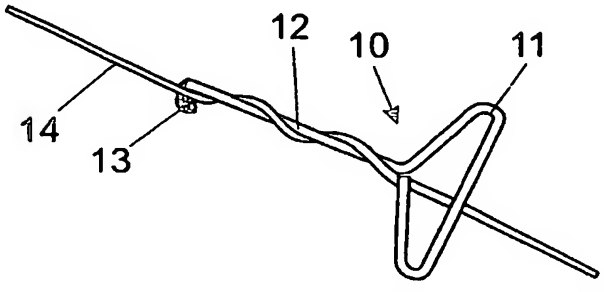
(54) Title: A METHOD AND SPOOL FOR SHORTENING AND OPTIONALLY TENSIONING ELONGATE TENSION MEMBERS



(57) Abstract: A method and a spool (1, 10, 21, 22, 35) for shortening the length of a cord (14) and optionally tensioning it at the same time is provided. The spool has a shank having two ends each of which has a transverse retainer formation (4, 13, 20, 40, 51 and 5, 11, 25, 33, 36, 42, 49, 50, 58) adapted operatively to prevent unravelling off the shank of cord wound around the elongate shank, at least whilst it is held under tension and with the axis of the shank extending in the same general direction as that in which the cord extends. A keeper formation (4, 13, 20, 40, 51) that is preferably one in the same with the ring and a formation at one end of the shank cooperates with a cord to maintain said end in association with the cord whilst the shank is rotated to wind cord onto the shank by rotation thereof. A torque transmitting formation (5, 11, 25, 33, 36, 42, 49, 50, 58) that is preferably one and the same with the retainer formation associated with the other end of the shank enables rotation of the shank substantially about its own axis to be effected manually in the case that an integral handle is provided or by engagement thereof with a tool (44, 52). Typically, the length of the shank is from about 10 to about 50 times the diameter of the shank.

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As regards the tensioning of other elongate tension members such as clotheslines, ropes and the like many of the prior art expedients of which applicant is aware employ a spool of some sort around which the tension member is wound in a plane that is at generally right angles to the axis about which the spool is rotated. Typical of this type of tensioner are those described in French patent 2,564,024; German patent DE 19700186; and US patents 559,133; 912,960; 1,191,598; 1,261,505; 1,476,026; 1,663,182; 1,670,257; 1,951,898; 1,972,321; 2,311,792 5,012,559; and 5,170,536.

Other tensioners employ spaced formations adapted to take up a predetermined amount of cord length that may be selected from a plurality of different amounts and some of such tensioners are described in US patents 5,655,267; 5,519,921; 5,383,256; 3,815,180; 3,711,901; 1,855,049; 550,970; and 432,429.

OBJECT OF THE INVENTION

It is, accordingly, an object of this invention to provide a method and spool for shortening the effective length of a cord whilst optionally tensioning same, whereby at least some of the disadvantages associated with prior art devices referred to above may be obviated, at least some extent.

SUMMARY OF THE INVENTION

In accordance with one aspect of the invention there is provided a spool for shortening the length of a cord and optionally tensioning it at the same time, the spool comprising a reel formation around which cord can be wound to shorten its effective length, formations for operatively preventing cord wound onto the reel from unwinding therefrom and means whereby the reel can be rotated either directly by hand or indirectly utilizing a tool, the spool being characterized in that the reel is in the form of an elongate generally straight shank around which cord is to be wound, the shank having two ends each of which has a transverse retainer formation adapted operatively to prevent unravelling off the shank of cord wound around the elongate shank, at least whilst it is held under tension, when the axis of the shank extends in the same general direction as that in which the cord extends; a keeper

formation at one end of the shank for cooperation with a cord to maintain said end in association with the cord whilst the shank is rotated to wind cord onto the shank by rotation thereof; and a torque transmitting formation associated with the other end of the shank for enabling rotation of the shank substantially about its own axis to be effected manually or by engagement thereof with a tool.

Further features of the invention provide for the transverse retainer formation at said one end of the shank to form also the keeper formation; for the retainer formation at the other end of the shank to form also the torque transmitting formation; for the length of the shank to be from about 10 to about 50 times the diameter thereof, preferably from 15 to 40 times the diameter; and for additional holding means to be provided for releasably engaging a cooperant cord to prevent unravelling thereof off the shank under conditions in which tension is removed from the cord.

In one preferred form of the invention the spool is formed from a suitable gauge of wire or rod that is bent to form a generally straight shank in the middle; a combination retainer formation and keeper formation at one end; and a combination retainer formation and torque transmitting formation at the other end. In that case the wire or rod can also be bent and optionally stamped to form any additional holding means for releasable engagement with a cooperating cord. Alternatively, any additional holding means could be formed as part of a separate element for attachment to a handle of the spool. Of course, no additional holding means is required, and in the simplest forms of the invention such an expedient is omitted in order to save cost. As a general rule, such additional holding means is only required to prevent unravelling of any cord wound onto it when tension is substantially entirely removed from the cord as tension in the cord substantially locks the spool against unravelling of cord therefrom.

In instances in which expedience dictates that the torque transmitting formation preferably be a manually operable handle, and in this regard a spool for shortening picture cords to thereby adjust the height of an associated picture is of particular note, such formation is simply formed integral with the spool generally as a continuation of a length of bent wire or rod. Typically the handle could be wing shaped to project outwardly on diametrically opposite sides of the shank and the

CLAIMS:

1. A spool (1, 10, 21, 22, 35) for shortening the length of a cord (14) and optionally tensioning it at the same time, the spool comprising a reel formation around which cord can be wound to shorten its effective length, formations for operatively preventing cord wound onto the reel from unwinding therefrom and means whereby the reel can be rotated either directly by hand or indirectly utilizing a tool, the spool being characterized in that the reel is in the form of an elongate generally straight shank (2, 12, 23, 31, 37, 41, 55) around which cord is to be wound, the shank having two ends each of which has a transverse retainer formation (4, 13, 20, 40, 51 and 5, 11, 25, 33, 36, 42, 49, 50, 58) adapted operatively to prevent unravelling off the shank of cord wound around the elongate shank, at least whilst the cord is held under tension and when the axis of the shank extends in the same general direction as that in which the cord extends; a keeper formation (4, 13, 20, 40, 51) at one end of the shank for cooperation with a cord to maintain said end in association with the cord whilst the shank is rotated to wind cord onto the shank by rotation thereof; and a torque transmitting formation (5, 11, 25, 33, 36, 42, 49, 50, 58) associated with the other end of the shank for enabling rotation of the shank substantially about its own axis to be effected manually or by engagement thereof with a tool (44, 52).

2. A spool as claimed in claim 1 in which the transverse retainer formation (4, 13, 20, 40, 51) at said one end of the shank forms also the keeper formation.

3. A spool as claimed in claims 2 in which the combined retainer and keeper formation (4, 13, 20, 40, 51) is a generally U-shaped formation extending at generally right angles to the length of the shank.

4. A spool as claimed in any one of the preceding claims in which the retainer formation (5, 11, 25, 33, 36, 42, 49, 50, 58) at said other end of the shank forms also the torque transmitting formation.

5. A spool as claimed in any one of the preceding claims in which the length of the shank is from about 10 to about 50 times the diameter of the shank.

6. A spool as claimed in claim 5 in which the length of the shank is from about 15 to 40 times the diameter of the shank.

7. A spool as claimed in any one of the preceding claims in which additional holding means (6, 28, 30) are provided for releasably engaging a cooperant cord to prevent unravelling thereof off the shank under conditions in which tension is removed from the tension member.

8. A spool as claimed in any one of the preceding claims in which the spool is formed from a suitable gauge of metal wire or rod that is bent to form a generally straight shank in the middle; a combination retainer formation and keeper formation at one end; and a combination retainer formation and torque transmitting formation at the other end.

9. A spool as claimed in any one of the preceding claims in which the torque transmitting formation is a handle (5,11) formed integral with the shank.

10. A spool as claimed in any one of claims 1 to 8 in which the torque transmitting formation (42, 49, 50, 58) is adapted for cooperation with a separate manually operable tool (44, 52) in the form of a crank.

11. A spool as claimed in claim 10 in which the spool has a generally axially extending axle (43, 59) for cooperation with a bore or socket in a cooperant part of said manually operable tool in order to align said part and the spool approximately axially during cooperant use thereof.

12. A method of shortening a cord comprising the steps of associating the keeper means of a spool as claimed in any one of the preceding claims with the cord; rotating the shank generally about its own axis by means of the torque transmitting formation with the shank extending transverse to the cord so as to wind cord around the shank to a required extent; and releasing the torque

transmitting formation such that the shank extends in the same general direction as the cord and the retainer means at each end serves to prevent unravelling of the cord from the shank.

13. A method as claimed in claim 12 in which the spool is manipulated such that the shank extends at an incline to the cord, at least during rotation of the shank to initiate winding of the tension member around the shank and, in the case that a plurality of revolutions of the shank are required to shorten the length thereof adequately, winding said plurality of revolutions on the shank towards the end thereof having the keeper formation, this being effected by manipulating the angle at which the shank extends transverse to the general length of the cord, followed by a decrease in the angle at which the shank extends relative to the cord so that a final revolution or part revolution of the cord spirals along a substantial portion of the length of the shank.

14. A picture having a cord for suspending it from a suspension point and spool as claimed in any one of claims 1 to 11 associated with the cord.